

High Capacity Optical/RF Routing Platform



communications



Objectives/Goals

- Enable high capacity airborne IP backbone capabilities through multiple integrated hybrid RF/FSO network communications
- Provide hybrid RF/FSO 100 Gbps re-programmable routing technology
- Provide network topology optimization, hybrid RF/FSO link networking and mobility management
- Enable technology growth to 100s Gbps aggregate hybrid RF/FSO routing

Military Utility

- Enables long-range, low latency network data aggregation and IP backbone capability
 - High capacity IP data distribution out of theater
 - ISR sensor data aggregation and distribution for off-platform processing

System Capabilities

- 100 Gbps Aggregate IP Routing Capacity
 - Up to 5 hybrid RF/FSO ports (e.g. 274-548 Mbps RF interface/ 10 Gbps FSO interface)
 - Up to 5 OC-48 ports
 - Up to 5 10/100/1000 Ethernet ports
 - Up to 5 10 Gbps Ethernet ports
- Re-programmable architecture
 - Emerging networking protocols
 - Topology optimization algorithms
 - Traffic management algorithms
 - Mobility management approaches
- Expansion slots for future capabilities

- CCA design, Signal Integrity and High Data Rates (e.g. 10s Gbps)
 - Backplane connector technology
 - Backplane materials
 - Full mesh switch fabric
 - Switch fabric transceivers

Program Accomplishments

- Base Effort (Sept 2005 – March 2006)
 - SRR Completed (Nov 2005)
 - Go Demonstration Successfully Completed (Mar 2006)
 - PDR Successfully Completed (Mar 2006)
- Option Effort (Nov 2006 – April 2007)
 - CDR Successfully Completed (Mar 2007)
 - Breadboards in build
- 2007 Mentor Graphics Technology Leadership Award – Best Design Military and Aerospace
- Current TRL = 3, 4

Base Effort Analysis/Go Demo Summary

- Demonstrated results of 10 Gbps backplane connector analysis
- Demonstrated 10 Gbps routing CAM lookup performance
- Demonstrated re-programmable routing architecture
- Simulation of mobility and hybrid RF/Optical links
- Simulation of store and forward effects on network performance